MULTIPLE NUMBER REPRESENTATIONS FOR MULTIPLICATION COMPLEXITY REDUCTION IN SIGNAL PROCESSING TRANSFORMS

Abstract:

A machine or method used in signal processing transforms that involve computing one or more sums each of one or more products. Multiplication for one product is implemented using one machine or method, and multiplication for a second product is implemented using a machine or method that is not capable of computing the first product. Alternatively, the numbers used in computing one product have a pair of finite-precision numeric formats that is not the same as the pair of finite-precision numeric formats of numbers used in computing a second product. Which machine or method is used depends on the particular representation of one or both numbers being multiplied, and on common properties of groups of allowed input number values and representations. The invention allows signal processing transforms with lower complexity than if a multiplication machine or method for the second product must also be able to compute the first product and with lower complexity than if all pairs of numbers that are multiplier inputs are required to have the same finite-precision numeric format pair.